
HDOT TM 8 - 00

Standard Test Method for Determining Total Moisture Content of Bituminous Mixtures or Mineral Aggregate Using Microwave Ovens

1. Scope

1.1 This test method covers the determination of the percentage of evaporable moisture in bituminous mixtures or mineral aggregates by drying in the microwave oven.

2. Referenced Documents

2.1 AASHTO Standards:

T2 Sampling of Aggregates

T168 Sampling Bituminous Paving Mixtures

3. Safety

3.1 Check the microwave oven for leakage. Microwave ovens which indicate leakage should not be used until the leakage is corrected as the microwave radiation may be injurious.

3.2 Use gloves for handling hot samples.

4. Apparatus

4.1 Microwave oven having variable time and power controls.

4.2 Microwave-safe container not affected by the heat, and of sufficient volume to contain the sample without danger of spilling.

4.3 Balance having a capacity of 1000 g (2.2 pounds) or more and accurate to 0.1 g.

4.4 A metal spoon or spatula of convenient size. (Optional)

5. Procedure

5.1 Determine Power Setting

5.1.1 Set power control to approximately 50% power.

5.1.2 Place 500 ml or 500 g (16.9 fluid ounces) of tap water into the container. Record the temperature of the water (T1). Set the microwave timer for five minutes and heat the container of water. Record the temperature of the water (T2). The difference between the temperatures T1 and T2 should be $24^{\circ} \pm 5^{\circ} \text{ C}$ ($75^{\circ} \pm 10^{\circ} \text{ F}$). If the difference is too low or too high, increase or decrease the power control setting and repeat this procedure. This procedure will determine the power control setting to be used.

5.2 Place the sample in a tared container and weigh to the nearest 0.1 g. The weighed mixture should be not less than 500 g (1.1 pounds).

5.2.1 Put the sample in the microwave oven. Turn oven on and dry the sample using the power control setting determined in 5.1.2.

5.2.3 After 5 minutes turn the oven off, remove the container and sample, weigh the sample and container to the nearest 0.1 gram, and record weight.

5.2.4 Place sample back in the oven. Turn oven on and dry sample for 5 more minutes.

5.2.5 Remove container and sample from oven, weigh to the nearest 0.1 gram and record weight.

5.3 Repeat steps 5.2.4. and 5.2.5 until a constant weight is obtained (approximately 30 minutes).

6. Calculation

6.1 Moisture Content (MC).

6.1.1 Calculate the percent moisture content as follows:

$$\% \text{ MC} = \frac{OW - FW}{FW} \times 100$$

Where:

O.W. = represents the original weight of the sample.

F.W. = represents the final weight of the sample.